

EXHIBIT D

Re: DUBLIN: VSA Tunning

1 message

RODRIGUES, Guillaume <guillaume.rodrigues@airliquide.com>

Wed, May 16, 2018 at 11:47 AM

To: "FRAIOLI, Bernard" <bernard.fraioli@airliquide.com>

Cc: "JILLHEWAR, Paresh" <paresh.jillhewar@airgas.com>, "HUI, Henry" <henry.hui@airgas.com>, Stephane Pusiol <stephane.pusiol@airliquide.com>

Many thanks Bernard. Very helpful.

Paresh,

Very very rough estimation of what could be the air by-pass based on these indications: if it is considered that the by-pass created by AA overfilling is equivalent to 5% of the MS height (100 mm at internal grid and 300 mm at external grid), 10% of the air flow would go through this by-pass. The order of magnitude of O2 concentration would hence be close to 85% at the first cycle. Then, I can't guess what would happen after few cycles...

So, it would be preferable to correct the AA/MS interface prior any restart with new or regenerated MS (it kills the quick and dirty solution that would have consisted in replacing only the polluted MS in R01).

Regards

Guillaume

2018-05-16 15:12 GMT+02:00 FRAIOLI, Bernard <bernard.fraioli@airliquide.com>:

Hi Guillaume,

At the bottom of the internal grid:

The position of the row of studs (around the circumference) to fix the expanded metal on the grid and which is welded on the expanded metal reinforcement, is normally positioned at (25 mm (item 15) + 20 mm (1/2 washer of the clip), about mini 50 mm. On the photo, on the left side, we can see this row of studs welded on expanded metal reinforcement (item 03 on the drawing) that is 80 mm high. So the level of alumina would be at 50 mm. Sometime, we do not see this row of studs and we do not see also this expanded metal reinforcement 80 mm high.

In this case, the height of alumina would be above 80 mm from the level of the bottom of the internal grid.

On the photo, the height of the alumina is variable around the grid from 50 mm to 80 mm.

Thank you.
regards.
Bernard.

Bernard FRAIOLI

Pressure Vessels Specialist

Air Liquide expert

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2018-05-15 19:18 GMT+02:00 RODRIGUES, Guillaume <guillaume.rodrigues@airliquide.com>:

Hi Bernard,

As discussed here under are the picture of alumina level. We are trying to locate the surface of alumina based on studs.

Thanks,
Guillaume

----- Message transféré -----

De : **JILLHEWAR, Paresh** <paresh.jillhewar@airgas.com>

Date : mercredi 2 mai 2018

Objet : Re: DUBLIN: VSA Tuning

À : "RODRIGUES, Guillaume" <guillaume.rodrigues@airliquide.com>, "PUSIOL, Stephane" <stephane.pusiol@airliquide.com>, "HUI, Henry" <henry.hui@airgas.com>

Hi Guillaume,

I added few notes to our last discussion. Below are the "unknown probability" items we discussed

- **too high amount of alumina installed** -> I checked with our contractor on this. They mentioned the height of the Alumina installed is upto the bottom of the mol sieve column or where the internal Oxygen side grid starts inside the vessel. See below photos of the Alumina level from inside the vessel. This level seems to be little (4-5") higher than the level suggested in the standard filling procedure.



High settelling of AA due to filling process -> The level of the Mol sieve was checked while taking the Mol sieve samples out. The Mol sieve levels are same as filled originally. Also there was no gap observed between the membrane and top of the mol sieve.

MS quality -> After taking the samples out we sent some of the samples to Zeochem. We have the initial results from the Zeochem lab. See attached file. Based on the discussions with Zeochem they are ruling out the possibility of moisture contamination atleast on the top part of the beds where the samples were taken out. The results are similar to the original regen sieve received from Zeochem.

MS pollution during filling or drum storage on-site or during cocooning -> Samples received by the R&D on 04/30. The results are awaited. Once the results are available we can compare with Zeochem lab results and discuss the possibility of MS pollution

O2 Flushing: We have received the procedure from AL Australia for the flushing of beds with O2. We are preparing the pipeline parts and installing it today. We will do an internal safety review and flush the beds later this week.

Thanks,

Paresh Jillhewar, P.E.
Airgas, an **Air Liquide** company
Phone: 713-896-2126
Cell: 713-419-7421

On Fri, Apr 20, 2018 at 10:58 AM, RODRIGUES, Guillaume <guillaume.rodriques@airliquide.com> wrote:

Hi Paresh,

herunder is a summary of the root causes of such low O2 purity that we discussed today, including points already mentionned by Stéphane (**unknown probability**, low probability):

- **No contact between membrane and top of MS**: Membrane installation & Air instrumentation pressure checked
- **too high amount of alumina installed** -> maximum 2 inches of overfilling -> could't explain a so low purity (post meeting note: the AA height in MS area should be 0.2-0.3 m to explain a so low purity) burt this point must be checked again
- **High settelling of AA due to filling process** -> MS migrates in AA area -> water is not properly removed -> water pollutes MS from air side (so no direct link with O2 dew point)
- **O2 pollution (valve leak)** -> dew point measured is very low
- **MS quality** -> degradation must be very high, Zeochem CoA show no issue -> samples to be analyzed by CRPS
- **MS pollution during filling or drum storage on-site or during cocooning** -> no issue anticipated (cocooning with vaporized N2) but samples to be analyzed by CRPS
- **Air instrument leak** -> MS pollution due to water in AI and membrane leak or direct N2 by-pass due to holes in the membrane -> test leak show low leak rate on 2 adsorbers and a moderate leak on the third one -> not consistent with symmetrical behaviour of adsorbers and dew point measurement of AI
- **wrong O2 analysis** -> cross-checked analyses
- **cycle tuning** -> ref. Stéphane's answer: purity gap seems too important to come from cycle tuning

I copied Federico, who is the contact guy in R&D in order to discuss if and when N2 isotherms (as is and regenerated states) could be performed. Additional samples of top-up Z10-05-03 sieve and un-regenerated (by Zeochem) MCI sieves to be added to the existing sample list.

AL Australia wrote a procedure to perform exceptional O2 flushing. I will try to recover and share it with you, then it must be discussed with Stéphane if such protocole can be applied on this unit (safety issue and VP protection).

Please fill free to complement,

Regards,

Guillaume

2018-04-19 23:42 GMT+02:00 JILLHEWAR, Paresh <paresh.jillhewar@airgas.com>:

Thanks Guillaume,

I will set up a meeting in our calendar for tomorrow at 2pm Paris time. Please let me know if I can call you directly like today.

Attached are the lab results we have received from Zeochem for the regen material. Look at the last 2 tabs of the excel file for the regen material results and Sieve Nitrogen capacity.

Also we have collected some samples from the VSA beds. The samples are collected from all 3 beds at different heights. The deepest sample we collected is 7' deep in the bed. Please see attached file with sample collection locations.

Let me know if you need any other information for tomorrow's discussion.

Thanks,

Paresh Jillhewar, P.E.
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On Thu, Apr 19, 2018 at 1:03 PM, RODRIGUES, Guillaume <guillaume.rodriques@airliquide.com> wrote:
Hello,

I have been trapped in too many topics today, so that I have not been able to answer to Paresh. I am available tomorrow from 2 pm to 4 pm Paris time to give a hand.

Guillaume

2018-04-19 16:21 GMT+02:00 Stephane PUSIOL <stephane.pusiol@airliquide.com>:
Hello Paresh,

Sounds good

We need to talk with Guillaume to define what type of analysis should be done and this will define where to send the bottles.

Stéphane Pusiol

Le mer. 18 avr. 2018 à 15:54, JILLHEWAR, Paresh <paresh.jillhewar@airgas.com> a écrit :
Hi Stephane,

Thank you for your comments.

GOX dew point: The GOX dew point was measured using the Parametric Moisture monitor 35 yesterday. The Moisture monitor was showing the dew point at -60F. The dew point was falling down further but I had to shut the plant down late in the evening.



Sample collection:

We have Rolan plant services onsite to collect the samples. Since they are onsite we will collect the samples from each bed. Also there is a potential leak in the membrane of bed 1, I will have them look at that while they are onsite. As suggested in your previous email we will collect the samples 2ft and 4ft deep near the air and oxygen grid side. If we can get the sample tool further down we may collect more samples.

I have the sample bottles onsite. We will collect about 50 to 100ml sample each. Once the samples are collected we will clearly mark them in the airtight bottles. Let me know if you can suggest where can we send them for analysis. In the past we have sent it to Zeochem but since they regenerated this material we like to send it out to a different lab.

Thanks,

Paresh Jillhewar, P.E.
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On Tue, Apr 17, 2018 at 10:34 AM, PUSIOL, Stephane <stephane.pusiol@airliquide.com> wrote:
Hello Paresh,

-I put in copy Guillaume Rodrigues-

GOX dew point you measured at -90°F (= -67°C) looks good so a mol sieve pollution by water is probably not the cause of GOX produced at only 70% O₂, whatever the flow rate.
Please do the same measurement with another portable dew point meter tomorrow to confirm the measure.

If you take samples of mol sieve tomorrow in the adsorbers (mushroom design):

1/ if you visually saw a stable GOX purity (+/-1% O₂) at skid outlet, whatever the adsorber in production, to me you can choose **only 1 adsorber for taking samples** (considering all adsorbers have the same problem)

2/ if water pollution is discarded (to be confirmed with second dew point measurement before taking samples), you can only sample at air side (external grid) and O₂ side (internal grid) - no need to sample at medium distance - and 2 different depth only (2 ft and 4ft, below 4 ft (1.5m) that should be very hard to insert the tool into the sieve) = **4 sample points**

3/ clearly identify the 4 samples : position & depth ie : AIR - 2ft and AIR - 4ft....

4/ if Nitrogen adsorption capacity is the cause - and not due to water pollution - the laboratory test shall be well specified before samples expedition, **Guillaume shall be able to help us.** (water % + N₂ capacity +

5/ as proposed by Zeochem, reduction of the vacuum level till the vacuum pump limit will desorb better the mol sieve but I don't believe it is going to close the (big) gap because I've never seen a so big performance improvement with 0.2 PSI lower. Take care because if you break the machine, Zeochem won't pay anything !!

Please consider the most risky operation is to damage the grid when taking sample close to the grid with the tool. Having a vertical position of the sampling tool reduce the risk but it is not really feasible at the air side due to the dome profile...

I hope it's clear

Best regards,

Stéphane PUSIOL

On-Site Operations Expert - IM Industrial Excellence | BL Base

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On 17 April 2018 at 15:43, JILLHEWAR, Paresh <paresh.jillhewar@airgas.com> wrote:

Hi Stephane,

We are scheduled to collect the Sieve samples from the beds tomorrow. We prepared the sampling tool for collecting the samples.

Can you suggest how many samples we should collect and the depth of the bed where the samples should be collected. I am hoping we can go as deep as about 10ft with the sampling tool. The total depth of the mol sieve in the bed is about 16ft.

Also I would like to mention I had a dew cup onsite last week to measure the dew point of the GOX out of the VSA. The dew point of the GOX from the VSA is less than -90F. It was a simple dew cup I was able to find last week and I am waiting for another moisture analyzer to verify the readings .



Thanks,

Paresh Jillhewar, P.E.
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On Fri, Apr 13, 2018 at 8:27 AM, PUSIOL, Stephane <stephane.pusiol@airliquide.com> wrote:
thank you for the news Paresh,

take care of taking samples and with no water pollution (rain, even sweat in the top of adsorbers !) and blow the top before entering with dry IA + close quickly the plastic bottles and add large tape in order to avoid the cap unscrew.

next step is next week. i'll be off next week but I'll read mails coming from you

enjoy your week end

Stéphane

On 13 April 2018 at 13:58, JILLHEWAR, Paresh <paresh.jillhewar@airgas.com> wrote:

Hi Stephane,

The filling of the vessels was done by Rolan plant services. They are experienced in the vessel filling and have done similar fillings on other AL VSAs.

Xavier was onsite for the commissioning activities for one month. He helped us with all the VSA commissioning and we also started the VSA while he was onsite to check the PLC program etc.

I will check for the sample from the remaining drum. I am also talking with Rolan plant services to be onsite early next week to collect the sample from the beds.

The analyzer is connected to the PLC but it is still not visible on the HMI. Our Controls Engineer had a family emergency this week so he was not able to be onsite this week. I am having a new controls engineer onsite next week.

Thanks,

Paresh Jillhewar, P.E.
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On Thu, Apr 12, 2018 at 4:05 AM, PUSIOL, Stephane <stephane.pusiol@airliquide.com> wrote:

Hello Paresh

I did not see any big level trouble with these pictures.

Did Xavier Cousin participate during the filling ? He's got good experience.

Can you share mol. sieve analysis from Zeocem (with water content measurement) ?

Have you take sample of mol sieve in the remaining drums and kept in plastic bottles with double cap ?

Last question : is analyzer now connected to PLC and visible in HMI ?

Best regards,

Stéphane PUSIOL

On-Site Operations Expert - IM Industrial Excellence | BL Base

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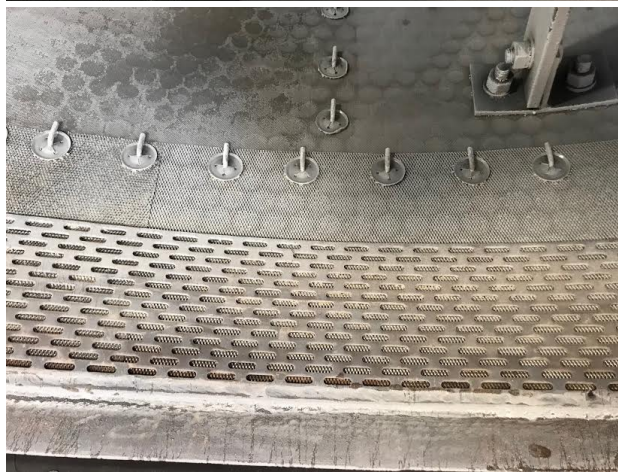
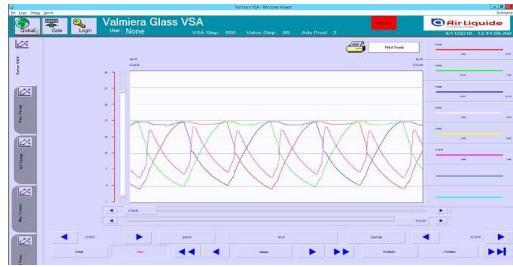
Mobile: +33 6 08 96 08 36

On 11 April 2018 at 07:01, JILLHEWAR, Paresh <paresh.jillhewar@airliquide.com> wrote:

Hi Stephane,

Attached is the more information as discussed on the phone. I tried to get the trend of PT 342 but it is not trending correctly. I will need to talk with my Controls Engineer on fixing it.

I am also attaching some photos during the filling of the adsorber columns. If I find more photos I will send them to you.



Thanks,

Paresh Jillhewar

On Mon, Apr 9, 2018 at 3:41 PM, Stephane PUSIOL <stephane.pusiol@airliquide.com> wrote:

Paresh,

We can speak tomorrow morning for you (before 2.pm or after 3.30pm Paris but before 5.00) or Wednesday after 3pm

Stéphane Pusiol

Le lun. 9 avr. 2018 à 20:39, JILLHEWAR, Paresh <paresh.jillhewar@airgas.com> a écrit :

Hi Stephane,

Thanks for the quick response.

Are you available to talk for sometime. Let me know a good time and I can call or we can google chat.

Thanks,

Paresh Jillhewar, P.E.
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On Mon, Apr 9, 2018 at 10:48 AM, PUSIOL, Stephane <stephane.pusiol@airliquide.com> wrote:

Hello Paresh,

I had a look to the process curves and cycle time you shared.

Of course the cycle is not perfectly tuned, we can see some differences between adsorbers (due to PT precision or cycle tuning) and valves and step duration / synchronisation could be adjusted but not to recover +20% O2.

Normally, if you reduce the production flow rate at 60-70% of the nominal, the VSA should produce GOX @ 95 %O2. The problem is surely bigger and fine tuning won't solve it.

-Double check the analyzer calibration : its inlet pressure shall be the same during calibration or VSA sampling. Check the sampling flow rate.

-Replace by a spare O2 analyzer to double check, visually on the local display + 4-20mA loop.

-Prepare a dew point meter to measure GOX moisture (in case of) with range +20 to -120°F

You could reduce the lowest vacuum pressure till 4.35 psiA (common for all VSA V) but take care with the vacuum pump LL limit, which I don't know for this machine, but I don't think this will solve the problem.

Finally, I do not recommend you to run the VSA @ 70% O2 for hours since you don't know the exact cause.

Best regards,

Stéphane PUSIOL

On-Site Operations Expert - IM Industrial Excellence | BL Base

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On 9 April 2018 at 16:36, JILLHEWAR, Paresh <paresh.jillhewar@airgas.com> wrote:

Hi Flora,

I would like to follow up on the email I sent you last week and also update you on the latest data.

We ran the Dublin VSA since I sent the email to you. But we are still having issues with the oxygen purity. As you may know we are using regenerated MCI sieves in this VSA. The sieves are regenerated by Zeochem USA. I have attached the regenerated sieve report from the Zeochem.

Attached are the readings and trends from the latest run of the VSA. The VSA was ran at about 75.000scfh flowrate and we are only managing to get around 70% purity. The plant is designed for the 90% purity. I tried reducing the flow but it does not change the purity much.

Please see attached trends and let me know if you need anymore info or any comments.

Also we had a discussion earlier today with Zeochem on this issue and after looking at the VSA data they are suggesting below approach,

- Zeochem thinks we should run deeper vacuum on the beds with shorter cycles for 24 to 48hours. Please let me know if you can provide us timings for the shorter cycles. They suggest to recycle as much oxygen during the elution step to clean the beds. They think this step should help clean the beds and we should see improvement in the final purity.

I am also copying Stephane Pusiol and Guillaume Rodrigues on this email to see if they have any suggestions.

Your help is appreciated with this.

Thanks,

Paresh Jillhewar, P.E.
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On Fri, Apr 6, 2018 at 6:26 AM, JILLHEWAR, Paresh <paresh.jillhewar@airgas.com> wrote:

Thanks Xavier.

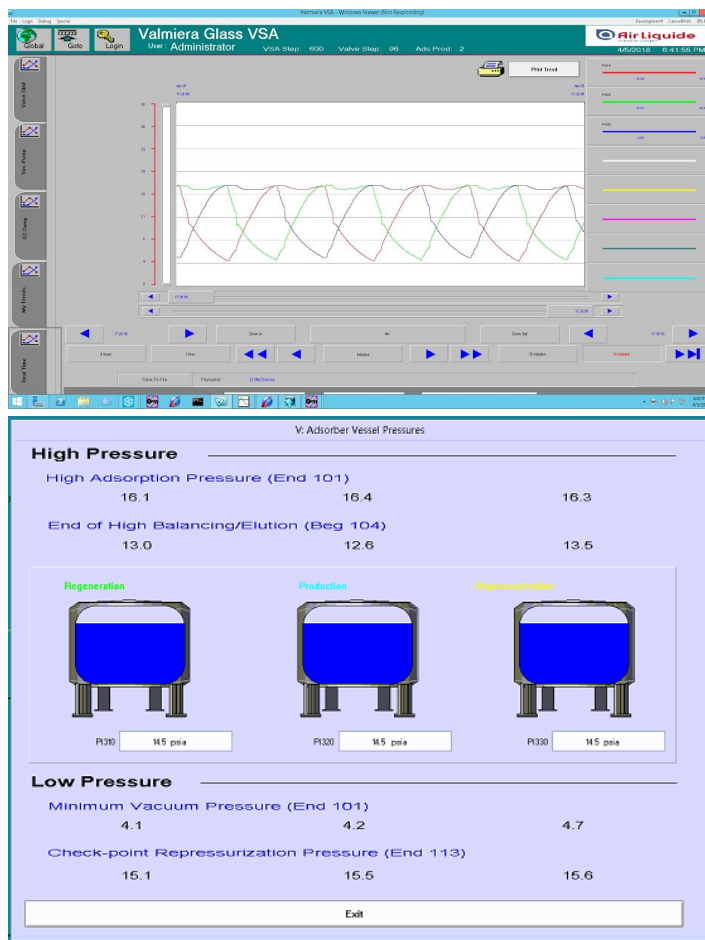
Hi Flora,

We ran the VSA unit for several hours on Wednesday and Thursday of this week. Below is the latest trend of the run we had yesterday. I am having trouble with downloading the trends from the HMI and I will send you more information as soon as it is fixed.

We ran the VSA yesterday with the changed cycle times as shown in the last column of the below photo,

The highlighted are the steps times we changed to for the VSA run.

STEP	Normal Run TANCO 4-3-18	Reduced Run As found 4-3-18	Normal Run As found 4-3-18	Damaged As found 4-5-18
101	1.5	2.0	2.0	
102	1.5	1.4	1.4	
103	3.0	2.0	3.5	3.0
104	.4	.4	0.4	
105	0/.2	.2	.2	
106	0/.2	1.2	1.2	
107	0/X	.0	0	
108	0/.2	.2	.2	
109	.1	.2	.2	
110	2.4	2.4	2.4	
111	6.0	3.0	8.7	8.0
112	2.0	2.0	2.0	
113	7.0	7.0	8.0	5.0
114	2.0	2.0	2.0	
115	1.0	1.0	1.0	
116	1.0	1.0	1.0	



We are having issue with the purity of the Oxygen product. The purity do not seem to go higher than the 71 - 72% of Oxygen in the product stream. I am also checking the analyzer calibration.

We checked the valve closing multiple times and they seemed to be closing properly and not leaking through.

Please let me know if you have any suggestions that we can try to improve the purity of the product stream.

If possible let me know if you are available to talk for some time today.

Thanks,

Paresh Jillhewar, P.E.
Airgas, an **Air Liquide** company
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On Thu, Apr 5, 2018 at 4:55 AM, COUSIN-SC, Xavier <xavier.cousin-sc@airliquide.com> wrote:

Hi Flora,

See attached "Main PLC Tmer Preset". The step times are very différents than normal ?! The VSA was running with this setting juste before re-location...

I was juste able to start the unit for one hour only before my departure... So Paresh (in copy) will send you the cycle data whith purities and flow has soon as possible. And if you can give him some advise about fine tuning he will be gladd.

Paresh: I forget to make copy of the cycle during VSA run test (1 hour) so can you send us this trend of 1 full cycle (1 by adsorber) juste before stop the VSA?

Thx

Best Regard,

Xavier COUSIN
Commissioning Supervisor



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Before printing, think about the environment

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Guillaume RODRIGUES

Development Team Manager, Standard Plants Product line



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HUI, Henry <henry.hui@airgas.com>

Re: Valmiera VSA Update

1 message

FRAIOLI, Bernard <bernard.fraioli@airliquide.com>

Thu, Jun 7, 2018 at 3:33 PM

To: "JILLHEWAR, Paresh" <paresh.jillhewar@airgas.com>

Cc: Guillaume RODRIGUES <guillaume.rodriques@airliquide.com>, Minh PHAM-HUY <minh.pham-huy@airliquide.com>, "HUI, Henry" <henry.hui@airgas.com>, "PUSIOL, Stephane" <stephane.pusiol@airliquide.com>, Sylvain GRILLON <sylvain.grillon@airliquide.com>, Christian HATFIELD <christian.hatfield@airgas.com>

Hi Paresh,

I have already worked with Rolan plant services.

Thanks.

Best regards.

Bernard FRAIOLI

Pressure Vessels Specialist

Air Liquide expert

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2018-06-07 22:03 GMT+02:00 JILLHEWAR, Paresh <paresh.jillhewar@airgas.com>:

Hi Bernard,

Yes, the membranes will be cleaned of any sealant/mastic tapes from the last application. The contractor will clean all the membranes before installing it at the end of vessel refilling.

Thanks,

Paresh Jillhewar

On Thu, Jun 7, 2018 at 3:28 AM, FRAIOLI, Bernard <bernard.fraioli@airliquide.com> wrote:

Hi Paresh,

Just a question for the cleaning of the membrane. Have you removed the remaining sealant on the membrane for the new application?

The application surface of the sealing strip must be clean to avoid air leakage.

Thank you.

Best regards.

Bernard FRAIOLI

Pressure Vessels Specialist

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2018-06-07 1:46 GMT+02:00 JILLHEWAR, Paresh <paresh.jillhewar@airgas.com>:

Hi Minh, Guillaume, Sylvain,

Here is an update on the activities at Valmiera VSA at Dublin, Ga.

- Last week the VSA was ran at different flowrates to observe the performance. The flowrate was varied between 54000scfh to 85000scfh. The product purity varied from about 71.5% at lower rate to about 69% at higher flowrate. I also observed the purity at the initial cycles after the start up. During the initial cycles the purity was increasing about steadily and settled around ~71% initially.
- Due to bad/rainy weather for last few weeks at Dublin, the vessels emptying work was delayed till current week.
- Rolan plant services is onsite now and emptied one Adsorber vessel (R03) so far. The height of Alumina they found at the center column was about 3 to 4" high. See photos below.



- Additional Alumina was removed from the vessel. Below is the photo of the vessel after removing excess Alumina from the bed.



- Onsite Mechanical contractor checked the vessel internals. There is no visible damage seen to the vessel internal.
- The Mol sieve material is being collected in the supersacks. Mol sieve samples are being collected every about 2ft depth.
- All other vessels will be emptied by end of this week. I will be sending additional photos of the other 2 vessels internals.
- Mol sieve will be transported immediately to Zeochem at Louisville, KY for regeneration.
- Zeochem has scheduled to regenerate the material as soon as they receive it later this week. It is expected the regenerated material will be available during week of 18th Jun.
- Refilling of the regen material will be scheduled during the week of 18th Jun, weather permitting.
- Plant start up activities will start during the week of 25th Jun and expected to take about 2 weeks.

Please let me know if any questions.

Thanks,

Paresh Jillhewar



Re: VSA Mol Sieve samples

1 message

JILLHEWAR, Paresh <paresh.jillhewar@airgas.com>

Thu, May 24, 2018 at 8:12 AM

To: "BRANDANI, Federico" <federico.brandani@airliquide.com>, Guillaume RODRIGUES <guillaume.rodriques@airliquide.com>, Henry Hui <henry.hui@airgas.com>, "SCHUMACHER, Glenn" <glenn.schumacher@airgas.com>

Dear Federico,

Received the email. Thanks.

On Thu, May 24, 2018 at 9:08 AM BRANDANI, Federico <federico.brandani@airliquide.com> wrote:

----- Forwarded message -----

From: **BRANDANI, Federico** <federico.brandani@airliquide.com>

Date: 2018-05-24 7:59 GMT+02:00

Subject: Fwd: VSA Mol Sieve samples

To: "JILLHEWAR, Paresh" <paresh.jillhewar@airgas.com>

Dear Paresh,

could you please confirm me the reception of this message?

Best regards,
Federico

----- Forwarded message -----

From: **BRANDANI, Federico** <federico.brandani@airliquide.com>

Date: 2018-05-22 11:40 GMT+02:00

Subject: Re: VSA Mol Sieve samples

To: "JILLHEWAR, Paresh" <paresh.jillhewar@airgas.com>

Cc: Guillaume RODRIGUES <guillaume.rodriques@airliquide.com>, "PUSIOL, Stephane" <stephane.pusiol@airliquide.com>, "HUI, Henry" <henry.hui@airgas.com>

Dear Paresh,

hereunder you'll find the results of the N2 adsorption capacity measurements done on the samples that we have received may 16th. The 12 samples received they were all taken from the R01 vessel at different bed depths. The measurement protocol used was the same as the one used for the previous series of tests. As you can see from the data on the table, all the samples show a very similar N2 adsorption capacity and the difference between the "as-received" and the "activated" capacity is within the allowable values for all the samples. Thus, we can conclude that there is no pollution in any of the samples analyzed.

It remains open the question of why exceptionally low N2 adsorption capacity were found on the previously tested samples of the R01 vessel. At this stage one of the possible explanation is that there was some sort of pollution during the sampling process.

		N2 Adsorption As-Rec'd (ml/g)	N2 Adsorption Activated (ml/g)	(N2 As- Rec'd / N2 Activated) (%)	weight loss after regeneration (%)
VFAC	R01 - 8ft deep, Center	19.7	22.3	0.9	0.8
VFBA 2	R01 - 2ft deep, Air side	19.9	21.6	0.9	0.7
VFBO 2	R01 - 2ft deep, O2 side	19.6	20.8	0.9	0.5
VFBC	R01 - 2ft deep,	19.1	21.7	0.9	0.9

	Center				
VFCA	R01 - 3ft deep, Air side	17.5	18.8	0.9	0.6
VFCO 2	R01 - 3ft deep, O2 side	17.1	20.0	0.9	0.8
VFCC	R01 - 3ft deep, Center	17.1	19.3	0.9	0.8
VFDO 2	R01 - 4ft deep, O2 pipe side	18.8	20.9	0.9	0.4
VFDA	R01 - 4ft deep, Air side	18.5	20.2	0.9	0.7
VFDC	R01 - 4ft deep, Center	17.6	21.2	0.8	1.1
VFEC	R01 - 5ft deep, Center	18.1	20.4	0.9	0.8
VFFC	R01 - 6ft deep, Center	17.8	20.2	0.9	0.8

Please let me know if you need further information.
Best regards,
Federico

2018-05-15 18:06 GMT+02:00 JILLHEWAR, Paresh <paresh.jillhewar@airgas.com>:

Hi Federico,

FYI we have sent additional mol sieve samples from bed 1. Please see attached for the details on where the samples were collected. I had them collect more samples so that we can get a good profile of the mol sieve section.

Please confirm when you receive the samples and let us know earliest you can analyze and send us the results.

Thanks,

Paresh Jillhewar

----- Forwarded message -----

From: **Mail & More** <mailserver@notify.postalmate.net>

Date: Mon, May 14, 2018 at 9:56 AM

Subject: [EXTERNAL] EReceipt from Mail & More of Dublin

To: paresh.jillhewar@airgas.com

e-Receipt

Mail & More

1101-L Hillcrest Parkway
Dublin, GA 31021
(478) 272-7676
www.mailandmoreofdublin.com

Shipment-----

UPS worldwide Express
 Ship To:
 Frederico Brandani-L8
 Air Liquide
 1 Chemin de la Porte des loges
 Le Loges en Josas B.P 126
 JOUY-EN-JOSAS CEDEX, 78354
 FRANCE
 Package 259.68
 Contents:
 Samples
 Tracking #: 1ZX438W86691230896
 Shipment-----
 UPS Ground - Commercial
 Ship To:
 Doug Huelzman
 Zeochem LLC
 1600 W HILL ST
 LOUISVILLE, KY 40210-1750
 Package 16.69
 Tracking #: 1ZX438W80392935107
 Peanuts 3 @ 0.75 2.25 TX
 SUBTOTAL 278.62
 TAX
 State Tax on 2.25 0.18
 TOTAL 278.80
 TEND Visa 278.80
 Total shipments: 2
 Paresh Jillhewar: Airgas
 Audrey 05/14/2018
 #499846 10:56 AM
 Workstation: 41 - Auxiliary
 Workstation 41
 CCTran# 5bdd7efe-027a-400f-ba23-
 33bb925f7979

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 Thanks,

Paresh Jillhewar, P.E.
 Airgas, an Air Liquide company
 Phone: 713-896-2126
 Cell: 713-419-7421

Sample collection date: 5/11/2018

Location: Bed R01

Samples collected at 180 degree or oppsite side of the center grid from the previously collected samples on 4/18/18

Sample Bo	Sample	Vessel	Sieve Type	Sample Location (Depth and side)
VFAC	Z10-05-03/Regen Mol Sieve	R01	Z10-05-03/MCI Regenerated Sieve	8" deep center
VFBA - 2	Regen Mol Sieve	R01	MCI Regenerated Sieve	2ft deep, Air side
VFBO - 2	Regen Mol Sieve	R01	MCI Regenerated Sieve	2ft deep, O2 side
VFBC	Regen Mol Sieve	R01	MCI Regenerated Sieve	2ft deep, center
VFCA	Regen Mol Sieve	R01	MCI Regenerated Sieve	3ft deep, Air side
VFCO	Regen Mol Sieve	R01	MCI Regenerated Sieve	3ft deep, O2 side
VFCC	Regen Mol Sieve	R01	MCI Regenerated Sieve	3ft deep center
VFDO - 2	Regen Mol Sieve	R01	MCI Regenerated Sieve	4ft deep, O2 pipe side
VFDA - 2	Regen Mol Sieve	R01	MCI Regenerated Sieve	4ft deep, Air side
VFDC	Regen Mol Sieve	R01	MCI Regenerated Sieve	4ft deep, center
VFEC	Regen Mol Sieve	R01	MCI Regenerated Sieve	5ft deep, center
VFFC	Regen Mol Sieve	R01	MCI Regenerated Sieve	6ft deep center

Valmiera VSA update

1 message

JILLHEWAR, Paresh <paresh.jillhewar@airgas.com>

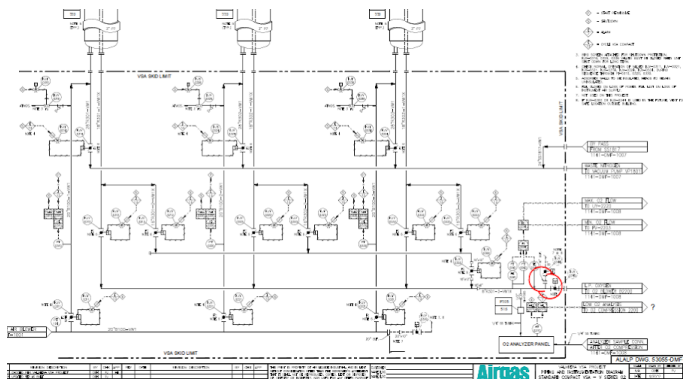
Fri, Jun 1, 2018 at 6:29 AM

To: Guillaume RODRIGUES <guillaume.rodrigues@airliquide.com>, Minh PHAM-HUY <minh.pham-huy@airliquide.com>, "HUI, Henry" <henry.hui@airgas.com>

All,

Here is update on the item we discussed on the call this week Tuesday,

- Check the O2 header from the VSA skid for any Sieves, dust.
 - O2 header checked by opening 8" blind flange. No Sieves or dusting was seen in the pipe. See attached photos for the pipe internals. See clouded portion where the O2 header was opened.
 -





- I will be running the VSA today at different flow rate (~40,000scfh to 80,000scfh) to see the change in the purity if any.

Thanks,

Paresh Jilthekar